

Listing of the Claims

1. (currently amended) An ~~uncycled~~ electrode for a non-aqueous lithium electrochemical cell, comprising a lithium metal oxide having the formula $\text{Li}_{(2+2x)/(2+x)}\text{M}'_{2x/(2+x)}\text{M}_{(2-2x)/(2+x)}\text{O}_{2-\delta}$, in which $0 \leq x \leq 1$ and δ is greater than zero and less than 0.2, and in which M is a non-lithium metal ion with an average trivalent oxidation state selected from two or more of the first row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first and second row transition metal elements and Sn.
2. (original) The electrode of claim 1, where δ is less than 0.1.
3. (original) The electrode of claim 1, in which M is selected from Co, Ni, Mn, Ti, Mg and Al, and M' is selected from Ti, Mn, Zr, Ru and Sn.
4. (original) The electrode of claim 3, in which M is selected from Co, Ni and Mn, and M' is selected from Ti and Mn.
5. (original) The electrode of claim 4, in which M is selected from Co, Ni and Mn, and M' is selected from Mn.
6. (original) The electrode of claim 5, in which M is selected from Ni and Mn, and M' is selected from Mn.
7. (original) The electrode of claim 1, in which M is selected from Co, Ni and Mn and $x=0$.
8. canceled.
9. (currently amended) An electrode for a non-aqueous lithium cell, ~~comprising a lithium~~ having the formula of $x\text{Li}_{2-y}\text{H}_y\text{O} \cdot x\text{M}'\text{O}_2 \cdot (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$ made from a lithium metal oxide ~~having the formula of $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$~~ , in which $0 \leq x \leq 1$ and $0 < x < 1$, and in which M is a non-lithium metal ion with an average trivalent oxidation state selected

from two or more first-row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first- and second-row transition metal elements and Sn, the electrodes being preconditioned in a proton-containing medium with a pH<7.0.

10. (original) The electrode of claim 9, in which M is selected from Co, Ni, Mn, Ti, Mg and Al, and M' is selected from Ti, Mn, Zr, Ru and Sn.

11. (original) The electrode of claim 10, in which M is selected from Co, Ni and Mn, and M' is selected from Ti and Mn.

12. (original) The electrode of claim 11, in which M is selected from Co, Ni and Mn, and M' is selected from Mn.

13. (original) The electrode of claim 12, in which M is selected from Ni and Mn, and M' is selected from Mn.

14. (currently amended) A method of synthesizing the ~~unrecycled~~ electrode of claim 1 in which ~~the~~ $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$ electrode is subjected to a reducing environment at a temperature between about 150°C and about 1000°C.

15. (original) A method according to claim 14 in which the reducing environment consists of one or more of ammonia gas, hydrogen gas, nitrogen gas and carbon.

16. (original) A method according to claim 15, in which the reducing environment is ammonia gas.

17. (original) A method according to claim 14, in which the reducing temperature is between 150°C and 600°C.

18. (original) A method according to claim 17, in which the reducing temperature is between 150°C and 400°C.
19. (original) An electrode made according to the method of claim 14.
20. (currently amended) A method of synthesizing the electrode of claim 9 by subjecting the $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$ electrode to a proton-containing medium with $\text{pH} < 7.0$ and thereafter heating the electrode ~~below 500~~ above 100°C for less than 24 hours.
21. (original) A method according to claim 20 in which the electrode is heated below 400°C.
22. (original) A method according to claim 20 in which the proton-containing medium consists of de-ionized water, nitric acid, acetic acid, or hydrochloric acid.
23. (original) An electrode made according to the method of claim 20.
24. (currently amended) A non-aqueous lithium electrochemical cell comprising a negative electrode, an electrolyte and an ~~uncycled~~ positive electrode having a lithium metal oxide having the formula $\text{Li}_{(2+2x)/(2+x)}\text{M}'_{2x/(2+x)}\text{M}_{(2-2x)/(2+x)}\text{O}_{2-\delta}$, in which ~~$0 \leq x < 1$~~ $0 < x < 1$ and δ is greater than zero and less than 0.2, and in which M is a non-lithium metal ion with an average trivalent oxidation state selected from two or more of the first row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first and second row transition metal elements and Sn.
25. (currently amended) A non-aqueous lithium electrochemical cell comprising a negative electrode, an electrolyte and an ~~uncycled~~ positive electrode having the formula of $x\text{Li}_{2-y}\text{H}_y\text{O} \cdot x\text{M}'\text{O}_2 \cdot (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$ made from a lithium metal oxide ~~having the formula of $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$~~ in which $0 < x < 1$, and in which M is a non-lithium metal

ion with an average trivalent oxidation state selected from two or more first-row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first- and second-row transition metal elements and Sn, ~~said positive the electrodes being preconditioned in a proton-containing medium with a pH<7.0.~~

26. (currently amended) A non-aqueous lithium battery comprising a plurality of electrically connected electrochemical cells, each cell having a negative electrode, an electrolyte and an ~~uncycled~~ positive electrode comprising a lithium metal oxide having the formula $\text{Li}_{(2+2x)/(2+x)}\text{M}'_{2x/(2+x)}\text{M}_{(2-2x)/(2+x)}\text{O}_{2-\delta}$, in which ~~$0 \leq x \leq 1$~~ $0 < x < 1$ and δ is greater than zero and less than 0.2, and in which M is a non-lithium metal ion with an average trivalent oxidation state selected from two or more of the first row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first and second row transition metal elements and Sn.

27. (currently amended) A non-aqueous lithium battery comprising a plurality of electrically connected electrochemical cells, each cell having a negative electrode, an electrolyte and an ~~uncycled~~ positive electrode ~~comprising~~ having the formula $x\text{Li}_{2-y}\text{H}_y\text{O} \bullet x\text{M}'\text{O}_2 \bullet (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$ made from a lithium metal oxide having the formula of $x\text{Li}_2\text{M}'\text{O}_3 \bullet (1-x)\text{LiMO}_2$, in which ~~$0 \leq x \leq 1$~~ $0 < x < 1$, and in which M is a non-lithium metal ion with an average trivalent oxidation state selected from two or more first-row transition metals or lighter metal elements in the periodic table, and M' is one or more ions with an average tetravalent oxidation state selected from the first- and second-row transition metal elements and Sn, ~~said positive electrode being preconditioned in a proton-containing medium with a pH<7.0.~~

28. (currently amended) The electrode of claim 9, wherein said ~~electrode contains at least some $x\text{Li}_{2-y}\text{H}_y\text{O} \cdot x\text{M}'\text{O}_2 \cdot (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$~~ preconditioned electrode is at least partially dehydrated at a temperature above about 100°C.

29. (currently amended) ~~The~~ A non-aqueous lithium electrochemical cell ~~of claim 25,~~ wherein said positive electrode has at least some $x\text{Li}_{2-y}\text{H}_y\text{O} \cdot x\text{M}'\text{O}_2 \cdot (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$ having a negative electrode, an electrolyte and a positive electrode according to claim 28.

30. (currently amended) ~~The~~ A non-aqueous lithium battery ~~of claim 27, wherein said positive electrode has at least some $x\text{Li}_{2-y}\text{H}_y\text{O} \cdot x\text{M}'\text{O}_2 \cdot (1-x)\text{Li}_{1-z}\text{H}_z\text{MO}_2$ compounds in which $0 < x < 1$, $0 < y < 1$ and $0 < z < 1$~~ comprising a plurality of electrically connected electrochemical cells according to claim 29.

31. (original) The electrode of claim 9, wherein said proton-containing medium contains an inorganic acid.

32. (original) The electrode of claim 9, wherein said proton-containing medium contains HF.

33. (original) The electrode of claim 9, wherein said proton-containing medium contains fluoride ions.

34 - 35. (canceled)